Listeriosis *(Listeria monocytogenes)*

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1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Listeriosis is caused by the bacterium *Listeria monocytogenes*.

B. Clinical Description and Laboratory Diagnosis

Listeriosis is typically manifested as meningoencephalitis or bacteremia in newborns and adults. It may cause fever and abortion in pregnant women. Symptoms of meningoencephalitis include fever, headache, stiff neck, nausea and vomiting. The onset may be sudden or, in the elderly and in those who are immunocompromised, it may be gradual. Delirium and coma may occur. Newborns, the elderly, immunocompromised persons, and pregnant women are most at risk for severe symptoms. In pregnant women infection can be transmitted to the fetus causing spontaneous abortion, stillbirth or septicemia in the newborn. The case-fatality ratio in infected newborns is about 30%. Infections in healthy persons may only amount to a mild flu-like illness. Asymptomatic infections occur at all ages, although these are of importance during pregnancy. Laboratory diagnosis is based on isolation of *Listeria* from CSF, blood, amniotic fluid, placenta, meconium, lochia, gastric washings or other specimens. The serological tests are unreliable.

C. Reservoirs

Reservoirs for *L. monocytogenes* are soil, water, mud, silage, mammals and fowl.

D. Modes of Transmission

L. monocytogenes may be acquired by the fetus *in utero* or during delivery. Listeria can also be transmitted through ingestion of contaminated foods or through contact with infected animals or birds. Person-to-person transmission has also been reported in nosocomial outbreaks of listeriosis.

E. Incubation Period

A range of 3 to 70 days has been reported, with a median incubation period of about 21 days.

F. Period of Communicability or Infectious Period

Although *L. monocytogenes* may be shed for months in the stool of infected persons, person-to-person transmission is rare. Following delivery, mothers of infected newborns may shed *L. monocytogenes* for 7 to 10 days in vaginal secretions or urine.

G. Epidemiology

Listeria is widely distributed in nature. Most cases of human listeriosis are believed to occur sporadically, but foodborne and nosocomial outbreaks have been documented. Foods associated with infection include unpasteurized milk, soft cheeses, processed meats and contaminated vegetables. Unlike most other foodborne pathogens, *Listeria* tends to multiply in refrigerated foods that are contaminated. Newborns, the elderly, immunocompromised persons and pregnant women are at greater risk of infection. About 30% of diagnosed cases occur within the first 3 weeks of life. In the United States approximately 2500 cases per year are reported, and an estimated 500 deaths per year are related to listeriosis. In New Jersey approximately 25 cases are reported to NJDHSS annually.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition

CASE CLASSIFICATION

A. CONFIRMED
A clinically compatible case, **AND**
- Isolation of *Listeria monocytogenes* from a normally sterile site.

B. PROBABLE
A clinically compatible case that is epidemiologically linked to a confirmed case by NJDHSS.

C. POSSIBLE
Not used.

NOTE: Isolates of *L. monocytogenes* must be submitted within the three (3) working days to the New Jersey Department of Health and Senior Services, Division of Public Health and Environmental Laboratories, Specimen Receiving and Records , P.O. Box 361, John Fitch Plaza, Trenton, NJ 08625-0361.

B. Laboratory Testing Services Available

The Public Health & Environmental Laboratory (PHEL) will confirm the identification of *L. monocytogenes* in blood and cerebrospinal fluid. The PHEL requests that all laboratories submit within **three (3)** days all *Listeria* isolates cultured for typing to aid in public health surveillance (N.J.A.C. 8:57-1.6 (f)) to the NJDHSS, Division of Public Health and Environmental Laboratories, Specimen Receiving and Records, P.O. Box 361, John Fitch Plaza, Trenton, NJ 08625-0361. For more information contact the PHEL at 609.292.7368.

PHEL will test implicated food items from a cluster or outbreak. Laboratories must obtain authorization from the Division of Epidemiology, Environmental and Occupational Health Services prior to the submission of food samples suspected of contamination with *L. monocytogenes*.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To track the occurrence of listeriosis so that sources of major public health concern (*e.g.*, food sources) may be identified and control measures initiated.

B. Laboratory and Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that laboratories report (by telephone, confidential fax, over the Internet using the Communicable Disease Reporting System (CDRS) or in writing) all cases of listeriosis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located.

C. Local Health Department Reporting and Follow-Up Responsibilities

1. **Reporting Requirements**
The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officer must report the occurrence of any case of listeriosis, as defined by the reporting criteria in Section 2 A above. Current requirements are that cases be reported to the NJDHSS Infectious and Zoonotic Diseases Program using the CDS-1 form. A report can be filed electronically over the Internet using the confidential and secure Communicable Disease Reporting System (CDRS).

2. **Case Investigation**
   a. It is the health officer's responsibility to investigate the patient and complete a CDS-1 form by interviewing the patient and others who may be able to provide pertinent information. Much of the information can be obtained from the patient healthcare provider or the medical record.
   b. Use the following guidelines to conduct the investigation:
      1) Accurately record the demographic information, occupation (if applicable), date reported to your office, date investigation started and date of diagnosis.
      2) Record the clinical information including healthcare provider information, hospitalization dates (if applicable), date of symptom onset, and outcome.
      3) Record the type of infection caused by *L. monocytogenes* (e.g., bacteremia, encephalitis, meningitis, neonatal sepsis).
      4) Ask about possible underlying diseases.
      5) Record the type of specimen from which *Listeria* was isolated, the type of lab test used, and date the first positive culture was obtained. If other lab tests were used diagnostically (e.g., bacterial antigen screen) please indicate the type of test(s) used and date(s) tested. Check if isolate was submitted to PHEL for further testing.
      6) If the patient was diagnosed while pregnant or within 2 weeks of delivery, indicate the outcome of the pregnancy and associated dates.
      7) Determine exposure history. Ask the patient about suspect food items consumed and contact with livestock during the 3 weeks prior to illness.
      8) If the disease is suspected to be foodborne, record any restaurants at which the patient ate, suspect foods, and date consumed.
      9) If the patient was a newborn, determine if the mother was tested for listeriosis. Determine exposure history of the mother.
      10) If there have been several unsuccessful attempts to obtain patient information (*e.g.*, the patient or healthcare provider does not return calls or does not respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely. **If CDRS is used to report, enter collected information into "Comments" section.**

   c. After completing the case report form, attach lab report(s) and mail (in an envelope marked "Confidential") to NJDHSS, or the report can be filed electronically over the Internet using the confidential and secure Communicable Disease Reporting System (CDRS).
   The mailing address is:

      NJDHSS
      Division of Epidemiology, Environmental and Occupational Health
      Infectious and Zoonotic Diseases Program
      P.O.Box 369
      Trenton, NJ 08625-0369

   d. Institution of disease control measures is an integral part of case investigation. It is the local health officer's responsibility to understand, and, if necessary, to institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.12)

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of listeriosis in a city/town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle, such as food, should be sought and applicable preventive or control measures should be instituted. Consult with the Infectious and Zoonotic Diseases Program NJDHSS at 609.588.7500. The Program staff can help determine a course of action to prevent further cases and can perform surveillance for cases across jurisdictions that may be difficult to identify at a local level.

Multi-State Clusters

The Centers for Disease Control and Prevention (CDC) is working to identify and analyze multistate clusters of listeriosis. Cases, which may be part of such clusters, will require additional follow-up and data collection from local health departments. Directions on follow-up activities for such situations will be provided by NJDHSS staff on a case-by-case basis.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the Infectious and Zoonotic Diseases Program (IZDP) and the Food and Drug Safety Program (FDSP). The FDSP can help coordinate pickup and testing of food samples. If a commercial product is suspected, the FDSP will coordinate follow-up with relevant outside agencies (e.g. FDA, USDA). The FDSP may be reached at 609.588.3123.

Note: The role of the FDSP is to provide policy and technical assistance with the environmental investigation such as interpreting the New Jersey Food Code, conducting a hazard analysis and critical control point (HACCP) risk assessment, initiating enforcement actions and collecting food samples.

The general policy of the Public Health and Environmental Laboratories (PHEL) is only to test food samples implicated in suspected outbreaks, not in single cases (except when botulism is suspected). The local health officer may suggest that the holders of food implicated in single case incidents locate a private laboratory that will test food or store the food in their freezer for a period of time in case additional reports are received. However, a single, confirmed case with leftover food consumed within the incubation period may be considered for testing.

A national or regional recall of a food product for *Listeria* contamination often initiates a desire by consumers to have implicated food samples tested for contamination. The PHEL will perform such testing on a case-by-case basis (*e.g.*, high-risk individual such as a pregnant woman). Requests for testing should be directed to the FDSP at 609.588.3123.

Personal Preventive Measures/Education

To avoid infection with *Listeria*:

- Thoroughly cook all meat, including hot dogs, and thoroughly reheat food until steaming hot.
- Wash all raw vegetables. Avoid raw (unpasteurized) milk or foods made from raw milk.
- Avoid contamination of cooked or ready-to-eat foods by raw meats or unwashed vegetables.
- Wash hands, knives, and cutting boards after handling uncooked foods.

In addition, individuals at high risk for developing listeriosis (*e.g.,* pregnant women or immunocompromised persons, including individuals taking steroids) should:

- Avoid soft cheeses. (Hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided.)
- Cook hot dogs and other ready-to-eat meats (such as sliced deli meat and prepackaged cold cuts) before eating.

ADDITIONAL INFORMATION

A Listeriosis Fact Sheet can be obtained at the NJDHSS at <http://www.state.nj.us/health>.

The formal CDC surveillance case definition for listeriosis is the same as the criteria outlined in Section 2 A of this chapter. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. When reporting to the NJDHSS, always refer to Section 2 A.

REFERENCES

American Academy of Pediatrics. 2000 Red Book: Report of the Committee on Infectious Diseases, 25th Edition. Illinois, Academy of Pediatrics, 2000.

CDC. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR. 1997; 46:RR-10.

CDC Website. Listeriosis: Frequently Asked Questions. Available at <http://www.cdc.gov/ncidod/dbmd/diseaseinfo/listeriosis_g.htm>.

CDC Website. Preventing Foodborne Illness: Listeriosis. Available at <http://www.cdc.gov/ncidod/publications/brochures/lister.htm>.

CDC. Diagnosis and Management of Foodborne Illnesses. A Primer for Physicians. MMWR, 2001; 50:RR-2

Chin, J., ed. Control of Communicable Diseases Manual, 17th Edition. Washington, DC, American Public Health Association, 2000.

Massachusetts Department of Public Health, Division of Epidemiology and Immunization. Guide to Surveillance and Reporting. Massachusetts Department of Public Health, Division of Epidemiology and Immunization, January 2001.

Schuchat, A., Bala, S., and Broom, C.V. Epidemiology of Human Listeriosis. Clinical Microbiology Reviews. 1991; 4:169-183.